

Introduction to excerpts from Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents

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On the 5th anniversary of the terrorist attacks on the World Trade Center, the National Institute of Justice—the research, development, and evaluation agency of the U.S. Department of Justice—published a major report on the identification of mass disaster victims using DNA analysis. The report was prepared by the Kinship and Data Analysis Panel, a multidisciplinary group of scientists assembled by the National Institute of Justice to offer guidance to the New York City Office of the Chief Medical Examiner in the identification of those who perished in the World Trade Center.

Although *Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents* is designed primarily to help the Nation's crime laboratory directors respond to future mass fatality disasters—be they natural disasters, large transportation accidents, or terrorist events—a variety of issues in the report concern the intersection of criminal

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justice and forensics, particularly as it relates to using DNA analysis to identify victims when other identification methods are not enough.

WHY DNA ANALYSIS?

DNA analysis is the newest of several methods used to identify human remains. (Other methods of identification include obvious physical attributes, such as birthmarks, tattoos, medical implants, clothing and jewelry); forensic anthropology; fingerprints; odontology; and radiology.) The need to use DNA analysis also may occur when the condition of human remains are fragmented and/or commingled due to the type of event or the duration of the recovery effort. When sufficient quantities of DNA from biological and “reference” samples exist, DNA profiling can be uniquely identifying.

DNA identifications are made by comparing DNA profiles from human remains to DNA profiles from reference samples. There are several potential sources of reference samples: (1) personal items used by the victim (for example, a toothbrush, hairbrush, or razor) and banked samples from the victim (for example, sperm or biopsy tissue that has been stored in a medical facility); (2) biological relatives of the victim (called “kinship samples”); and (3) human remains previously identified through other methods or other fragmented remains already typed by DNA.

THE FIRST 48 HOURS

The hours and days immediately following a mass fatality incident are inevitably chaotic. Within the first 48 hours, a laboratory director will likely be faced with a number of potentially “competing” issues, including responding to requests from elected officials, government agencies, the media, the victims’ families, and the laboratory staff. Decisions made during these first 48 hours largely will determine the efficiency and efficacy of the DNA identification effort. Lessons Learned From 9/11: DNA

Identification in Mass Fatality Incidents addresses some of these decisions, including:

- Are there sufficient people, resources, equipment, and funding to support the effort?
- What agencies/departments will interact with the laboratory? Who are the points-of-contact?
- Which agencies/departments will be in charge of specific activities—for example, collecting reference samples, collecting disaster samples, administration of funding?
- How and when will the laboratory director assess the degree to which samples are compromised (e.g., fragmentation, commingling, degradation)?
- How, when, and by whom will reference samples be collected?
- How will staff and resources be reorganized to handle the ongoing casework and the increased casework due to the mass fatality incident?
- Who will be the point of contact with the media?
- Will the laboratory outsource DNA testing? Which testing? To whom?
- How will progress in the DNA identification effort be relayed to family members, elected officials, and the media?
- What will the laboratory's policy be if there is a situation in which the genetic relationship is not consistent with the biological relationship reported by the family?

Other “policy-related” parameters of a mass fatality DNA identification effort must also be established, such as:

HOW IMPORTANT IS DNA TO THE IDENTIFICATION EFFORT?

The degree to which human remains are fragmented or degraded determines the value of DNA analysis in the identification process. Large body parts lend themselves to identification by less costly methods, such as X-ray, dental examination, and fingerprints. However, DNA analysis is the only viable method for identifying severely fragmented or degraded remains. Even when whole bodies are recovered, DNA analysis still may be the best approach when materials that are necessary for other methods of identification—for example, dental records or verified body identification by friends or relatives—are unavailable.

WILL EVERY PERSON OR EVERY FRAGMENT BE IDENTIFIED?

The answer to this question frames the scope of the DNA identification effort. Obviously, intact bodies will require fewer testings than fragmented remains, although decomposing bodies may not easily yield full profiles. For example, in an airplane crash with 50 victims, in which each victim’s remains are fragmented into many pieces, the identification effort will end sooner if the goal is to identify each victim, rather than each fragment of human remains. Everyone—the public, the policymakers, and the laboratory personnel—needs to understand the answer to the important question: “When are we finished?”

If the policy is to identify all of the victims, DNA analysis would stop as soon as the last victim is identified, which means that some human remains may never be analyzed or returned to the families. However, when the goal of the effort

is the attempted identification of all fragments, the work of the laboratory likely will be greater and take much longer.

It is important to consider that, if a mass fatality incident is so large and devastating that it affects the psyche of a community, a country, or the world, the scope of the identification effort may be broadened to help acknowledge the breadth of the emotional ramifications. After the 9/11 attacks, for example, the Mayor of New York City directed the Office of Chief Medical Examiner to do everything humanly possible to identify every fragment of human remains. And fragmented remains found over five years later were subjected to analysis for that reason.

WHAT IS THE MINIMUM FRAGMENT SIZE THAT WILL BE IDENTIFIED?

Policies also need to be established at the beginning of the effort that define “minimum fragment size” for DNA testing. A policy that has as a goal “all remains tested” may mean that many fragments may fail to yield results. In this situation, the DNA effort would take longer and be more costly—and, although families would be more likely to receive more of their loved one’s remains, they may be unprepared for the fragmentary condition of the remains or the length of time it takes to identify them.

WHAT WILL BE THE IMPACT ON A LABORATORY’S ROUTINE CASEWORK?

The impact of a mass fatality incident response on the laboratory’s primary mission—processing routine, criminal casework—must be considered. As resources are redirected to a mass fatality identification effort, backlog and turnaround times for regular casework are likely to increase. Even though law enforcement officials and officers of the court may support the laboratory’s role in a mass fatality incident response, they may still expect their cases to be completed in a timely manner.

CHAIN-OF-CUSTODY ISSUES

Most lawyers are familiar with traditional chain-of-custody issues, including the handling of evidence and how it is presented in the courtroom. In identifying victims of a mass fatality incident through DNA, however, chain-of-custody issues are multiplied exponentially due to the sheer number of samples—human remains, personal reference items, and samples from next of kin—needed to identify the victims.

Although chain-of-custody issues impact nearly every stage of a DNA identification effort, the collection of samples may be the most critical and frequently overlooked. In the urgency to identify the victims, there may be little attention paid to how the remains are collected. Therefore, protocols for chain-of-custody documentation in collecting evidence and handling samples must be a part of a laboratory's mass fatality incident plan. This is important not only for scene reconstruction and quality control, but also for any subsequent legal proceedings.

One of the most important initial decisions that must be made is whether to treat the incident as a humanitarian effort, civil incident, or criminal matter. This decision will drive chain-of-custody requirements. In a natural disaster, for example, the identification effort is largely humanitarian: identifying the victims so that their remains can be returned to the families and a death certificate and other documentation can be issued. However, when a mass fatality results from criminal activity, the identification effort has humanitarian and investigative components. In a criminal matter, the medical examiner may be involved in identifying the perpetrators and assisting with the law enforcement investigation.

Chain-of-custody issues can be complicated by the size and quality of the DNA from victims' remains. For example, environmentally harsh conditions at the incident site may limit the quantity of typable DNA recoverable from human

remains. Also, there may be a paucity of reference samples from close biological relatives or from victims' personal effects. For example, airline passengers often travel with their toothbrushes and hairbrushes, and these items may be lost or destroyed in an airline disaster. Kinship samples may be unavailable or scarce because the victim had few living biological relatives or because the relatives are unable or choose not to participate in the identification effort.

The chaotic environment at a mass disaster site can lead to sample mix-ups. Careful planning must take place to establish guidelines for collection, handling, and preservation of all samples to ensure accuracy throughout the process. The commingling of remains presents another potential problem. After a remains sample is analyzed, the laboratory may discover that it belongs to two or more individuals. The DNA may show that the bone and tissue come from different donors, as happened in World Trade Center (WTC), where remains were severely compacted.

Documenting the chain of custody of personal effects used as reference samples—for example, toothbrushes, razors, medical biopsy samples, and clothing—can also present challenges. For example, there may be inadvertent reference-sample switching by bereft loved ones. Or there may be name misspellings or unlinked nicknames associated with the same last name. In addition, family members may state with certainty that their missing relative was the only one to have contact with a personal effect that is brought in for DNA testing; but then, DNA analysis may show the profiles of two or more persons, further complicating the process. In some mass fatalities, such as a tidal wave, personal effects belonging to victims can be lost or contaminated at the site itself. Therefore, managing sample collection and tracking in a controlled, documented fashion is essential to a DNA identification process.

BEYOND CHAIN OF CUSTODY

Although “Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents” deals extensively

with laboratory protocols that can ensure proper chain-of-custody documentation, these form only one part of the identification process. Potential legal ramifications can extend far beyond traditional chain-of-custody procedures and documentation. Other major issues are as wide-ranging as dealing with the press, privacy, and working with an advisory panel of experts and/or bioethicists, and a prudent laboratory director will be ever-mindful of the potential for civil action. Such litigation could arise out of misidentification, release of information, control of remains, and intellectual property assertions regarding the development of new identification techniques. The report offers guidance regarding the need for a laboratory director to work closely with contracting officers and attorneys on issues such as contracts, intellectual property rights, and privacy issues, including the creation of a next-of-kin release policy.

There also are potential liability issues to consider if consultants or volunteers are used. It may be advisable, for example, to have consultants and volunteers sign a confidentiality agreement, stating that no data or information related to the DNA identification effort may be published or conveyed to the media without prior written consent of the laboratory director. Such an agreement might also state that no personal information should be disclosed regarding the victims, the state of the remains, or any other aspect of the incident that the consultant or volunteer learns as a result of working on the DNA identification effort. A comprehensive confidentiality agreement can help protect the laboratory from premature, unconfirmed reports and the victims' loved ones from insensitive divulging of gruesome details.

MANAGING EXPECTATIONS

As most lawyers know, “expectations”—held by a judge, jurors, or the public—can play a role in any legal case, including one that might arise after a mass fatality disaster and the subsequent identification of victims. For example, a laboratory director managing to a large DNA-based

identification effort will likely encounter a host of new constituents and all of them—the victims' families, public officials, the media, and the general public—will have expectations about the technology of DNA analysis and a timeline for DNA-based identifications. *Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents* addresses some of these concerns.

Although everyone likely will seek the same outcome—the maximum number of identifications and the maximum quantity of remains accurately returned to the family—their priorities may not be the same. Elected officials, for example, may focus on the speed of the identification process, whereas the laboratory's primary focus may be with the quality of the collection and analysis processes. Although these goals are not mutually exclusive, they may occasionally clash.

Also, as lawyers who have had to deal with DNA analysis and evidence already know, the public—including public officials and the media—knows little about the realities of DNA identification analysis, popular television shows notwithstanding. The public will have to be educated in order to develop realistic expectations about the speed and power of DNA testing, including the fact that some of the victims and some of the remains may not be identified.

SPECIAL REQUESTS

It is possible that lawyers may be involved in requests for special sample handling after a mass fatality event. The first hours after a major incident will be emotionally charged, with the possibility of many urgent requests that the laboratory perform immediate DNA analyses. Requests for expedited analyses may also occur later in the identification effort, if new remains are recovered or more useful personal items or relative references become available. In the World Trade Center DNA identification, for example, the laboratory frequently received instructions to collect and analyze reference samples—and compare them to already analyzed

DNA profiles in the hopes of making an identification—within 24 hours or less.

MEDIA RELATIONS

Because DNA technology is of such interest to the public, there are likely to be many DNA-related questions from the media—and lawyers may play a variety of roles in media relations and how information is given to the public.

Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents advises laboratory directors to be prepared to answer questions such as:

- How many victims have been identified?
- Have you identified the terrorists?
- How much time until the work is finished? Why is it taking so long?
- Will you be able to identify everyone? How many victims will you be able to identify? Why can't you identify all of them?
- What is the condition of the remains?

In addition, the issue of commingled remains may be a particularly sensitive one for families. And, the media may focus on new or unusual technologies, seeking information on their reliability, when they will be brought online, and how many new identifications they will yield. In addition, some reporters may want to “scoop” their competition and, because of this and the pressure on them to meet short deadlines, there often is insufficient time for a story to be vetted as fully as the scientific community would like. Unfortunately, some of what gets printed or broadcast may contain errors. If this happens, the gulf between perception and reality can create anxiety and confusion among the victims' families and the general public.

Most DNA laboratories will have no experience in working with the families of victims of a mass fatality incident. This report discusses the formation of family assistance centers and hotlines—and contains a number of

helpful forms, including the most recent version (in English and in Spanish) of a brochure on the DNA identification process that was distributed to victims' families after the 9/11 attacks.

Mostly, the families of victims simply want information. Most laypeople do not understand forensic identification modalities, and DNA can seem especially mysterious. Often, families do not know why they are being asked to provide their loved one's personal items or why the laboratory is requesting DNA samples from relatives. Some families may be concerned at what they perceive as the government asking questions about their DNA or their relationship to a mass fatality incident victim. Also, once DNA samples are provided, families may not hear anything for days, weeks, or even months, which can cause additional anxiety about the government's use of their DNA. The entire process can be bewildering and frustrating to the families of victims, which is why a laboratory's policies regarding sample disposition, privacy, and other personal information should be communicated clearly and respectfully.

Other issues that lawyers may be involved in include obtaining reference samples from a family member who was estranged from a victim, or situations in which biological relationships are discovered, upon DNA analysis, to be not as reported. In such cases, it may be advisable to consult with a bioethicist (see www.bioethics.net).

CONCLUSION

Through the President's DNA Initiative, Advancing Justice Through DNA Technology, a 5-year multi-million dollar program, NIJ is committed to providing funding, training, and assistance to assure that forensic DNA reaches its full potential to solve crimes, protect the innocent and identify missing persons (see www.dna.gov). Even before NIJ published *Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents*, we provided guidance to officials who were involved in the identification

of victims of the Southeast Asia tsunami (December 2004), and of Hurricane Katrina (August 2005), a disaster that revealed how any State or municipality can be overwhelmed by the operational requirements of responding to a mass fatality event.

As I said at the beginning of *Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents*, it is only through planning, training, and vigilant assessments of the capabilities of our public forensic laboratories that laboratory directors—and the policymakers who fund them—can prepare for a mass fatality event. Only through diligent planning can we ensure that our public resources are used as efficiently as possible. I believe this report will help us accomplish that mission.